

WHAT WE CLAIM IS:

1. A door opening/closing device for a vehicle comprising:
 - a door handle operated for opening/closing a vehicle door;
 - 5 a door lock mechanism for locking and unlocking the vehicle door;
 - a light-emitting means included in the door handle and visible from an outside of the door handle;
 - 10 a control mechanism for recognizing the opening/closing operation of the vehicle door based upon the operation of the door handle, operating the door lock mechanism so as to unlock the vehicle door when the opening operation of the vehicle door is recognized, operating the door lock mechanism so as to lock the vehicle door when the closing operation of the vehicle door is recognized, and controlling the light-emitting means to light-emit in response to the operation of the door lock mechanism.
- 15 2. A door opening/closing device for a vehicle according to claim 1, wherein the control mechanism recognizes the vehicle door opening operation based upon the operation of the door handle under a condition that a portable station carried by a user is close to the vehicle from a vehicle outside, and recognizes 20 the vehicle door closing operation based upon the operation of the door handle and recognition of the portable station moved from a vehicle inside to the vehicle outside.
- 25 3. A door opening/closing device for a vehicle according to claim 2, further comprising:
 - a sensor electrode included in the door handle so as to detect a contact of the door handle with the user,
 - 30 wherein the control mechanism recognizes the operation of the door handle based upon the contact of the door handle with the user detected by the sensor electrode.
4. A door opening/closing device for a vehicle according to claim 2, further comprising:
 - 35 an operational switch included in the door handle and capable of being switched on,
 - wherein the control mechanism recognizes the operation of the door handle

based upon a switch-on operation of the operational switch.

5. 5. A door opening/closing device according to claim 2, wherein the control mechanism controls the light-emitting means to light-emit when the control mechanism recognizes the portable station close to the vehicle from the vehicle outside.
10. 6. A door opening/closing device according to claim 2, wherein the door handle includes at least a first light-emitting means and a second light-emitting means, and the first and second light-emitting means are controlled individually.
15. 7. A door opening/closing device according to claim 6, wherein the control mechanism controls the second light-emitting means to light-emit upon the door unlock operation of the door lock mechanism and controls the first light-emitting means to light-emit upon the door lock operation thereof.
20. 8. A door opening/closing device according to claim 6, wherein the control mechanism controls the first light-emitting means to light-emit when the portable station is recognized to be close to the vehicle from the vehicle outside, and controls the second light-emitting means to light-emit when the portable station is recognized to have moved from the vehicle inside to the vehicle outside.
25. 9. A door opening/closing device according to claim 6, wherein the control mechanism controls the second light-emitting means to light-emit when the door handle operation is recognized for the vehicle door opening operation, and controls the first light-emitting means to light-emit when the door handle operation is recognized for the vehicle closing operation.
30. 10. A door opening/closing device according to claim 1, wherein the control mechanism controls the light-emitting means to continuously light-emit when one of the door lock operation of the door lock mechanism and the door unlock operation thereof is performed, and controls the light-emitting means to blink when the other one of the door lock operation of the door lock mechanism and the door unlock operation thereof is performed.
35. 11. A door opening/closing device according to claim 1, wherein the control

- mechanism controls the light-emitting means to blink when one of a recognition of a portable station coming close to the vehicle from a vehicle outside and a recognition of the portable station which has moved from a vehicle inside to the vehicle outside is performed, and controls the light-emitting means to
- 5 continuously light-emit when the other one of the recognition of the portable station coming close to the vehicle from the vehicle outside and the recognition of the portable station which has moved from the vehicle inside to the vehicle outside is performed.
- 10 12. A door opening/closing device according to claim 1, wherein the control mechanism controls the light-emitting means to continuously light-emit for a predetermined period of time when one of the door handle operation for the vehicle door opening operation and the door handle operation for the vehicle door closing operation is performed, and controls the light-emitting means to
- 15 blink for a predetermined period of time when the other one of the door handle operation for the vehicle door opening operation and the door handle operation for the vehicle door closing operation is performed.
- 20 13. A door opening/closing device according to claim 1, wherein the light-emitting means is surrounded by a light diffusion resin and is included in the door handle.
- 25 14. A method of recognizing an opening operation of a vehicle door comprising steps of:
- recognizing that a user carrying a portable station is coming close to a vehicle from a vehicle outside;
- controlling a light-emitting means to emit light when the user carrying the portable station is recognized to be coming close to the vehicle;
- 30 judging whether or not a user's hand is in contact with a door handle;
- unlocking the vehicle door by operating a door lock mechanism when the user's hand is judged to be in contact with the door handle; and
- controlling the light-emitting means to emit light for a predetermined time in a different manner from a light-emitting manner during the portable station coming close to the vehicle from the vehicle outside.
- 35 15. A method of recognizing an opening operation of a vehicle door according

to claim 14, wherein the light-emitting means is controlled to continuously light-up when the user carrying the portable station is recognized to be coming close to the vehicle and the light emitting means is controlled to blink for the predetermined time when the vehicle door is unlocked.

5

16. A method of recognizing an opening operation of a vehicle door according to claim 14, wherein the light-emitting means includes a first light-emitting means and a second light emitting means, the first light-emitting means is controlled to light-up when the user carrying the portable station is recognized to be coming close to the vehicle and the second light-emitting means is controlled to light-up for the predetermined period of time when the vehicle door is unlocked.

10

17. A method of recognizing a closing operation of a vehicle door comprising steps of:

15 recognizing that a user carrying a portable station has moved from a vehicle inside to a vehicle outside;

20 controlling a light-emitting means to emit light when the user carrying the portable station is recognized to have moved from the vehicle inside to the vehicle outside;

25 judging whether or not a user's hand is in contact with a door handle;

 locking the vehicle door by operating a door lock mechanism when the user's hand is judged to be in contact with the door handle; and

 controlling the light-emitting means to emit light in a different manner from a light-emitting manner during the portable station having moved to the vehicle outside from the vehicle inside.

30 18. A method of recognizing a closing operation of a vehicle door according to claim 17, wherein the light-emitting means is controlled to blink when the user carrying the portable station is recognized to have moved from the vehicle inside to the vehicle outside and the light emitting means is controlled to continuously light-up when the vehicle door is locked.

35 19. A method of recognizing a closing operation of a vehicle door according to claim 17, wherein the light-emitting means includes a first light-emitting means and a second light emitting means, the second light-emitting means is controlled

to light-up when the user carrying the portable station is recognized to have moved from the vehicle inside to the vehicle outside and the first light-emitting means is controlled to light-up when the vehicle door is locked.

- 5 20. A method of recognizing a closing operation of a vehicle door according to
claim 17, wherein the control of the light-emitting means to emit light can be
performed when the user's hand is in contact with the door handle, and the move
of the user carrying the portable station from the vehicle inside to the vehicle
outside can be recognized after the control of the light-emitting means to emit
10 light.

15

20

25

30

21